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THE UNIVERSITY OF ALBERTA

# THE EFFECTIVENESS OF ALTERING SMOKING BEHAVIOR AND ATTITUDES UNDER TWO TREATMENT INTENSITIES

by

Sandra Lee Schwanke

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "The Effectiveness of Altering Smoking Behavior and Attitudes Under Two Treatment Intensities" submitted by Sandra Lee Schwanke in partial fulfilment of the requirements for the degree of Master of Education in School and Counseling Psychology.

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## ABSTRACT

The increasing incidence of smoking among adolescents necessitates the development of programs effective in deterring smoking behavior and promoting negative attitudes towards smoking. This pilot study was the first phase of a three year study. Its purpose was to survey the smoking habits of grade seven students in an urban setting, and to evaluate the effectiveness of the "hard medical facts" approach under two treatment intensities, in altering smoking behavior and attitudes.

A control and two treatment groups were used, with all subjects receiving a pre-test questionnaire. The control group received no treatment program. The first experimental group received one smoking and health lecture - film presentation during a five month period, while the second experimental group received one smoking and health lecture - film presentation per month during this time. At the end of five months, all groups were administered the post-test questionnaire.

Results indicated that the intensive program was effective in promoting more negative attitudes towards smoking. The effect of the single presentation on attitudes was not determined due to sampling bias in the group. There were no significant differences found among the three groups with respect to proportion of smokers. However, in the two experimental groups, there were significant increases in the proportion of smokers between the pre and post-test.

The study will be continued in order to determine whether the increased proportion of smokers in the treatment groups was temporary, and whether the shift towards more negative attitudes will eventually influence smoking behavior.

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# CHAPTER I

## NATURE OF THE PROBLEM

The Editorial Board of The Canadian Journal of Public Health (1965) has written that "smoking has an adverse effect on health. The time has long since passed when hesitation or qualification is necessary when making so sweeping a statement" (p. 34). The report "Smoking and Health" presented by the Surgeon General, United States Public Health Service in 1964, gave evidence that the death rate from all causes was about 70 per cent higher for smokers than for nonsmokers. That was ten years ago. Since then medical researchers have made additional information available to the public. Has this information made an impact and has it affected attitudes and smoking behavior?

A dramatic increase in the incidence of lung cancer, heart disease, chronic bronchitis and pulmonary emphysema parallels the increase in cigarette production and marketing statistics. Differences in death rates between smokers and nonsmokers are particularly evident in the age group 50-69 years. The probability of dying from lung cancer or chronic bronchitis is more than twenty times as high for heavy smokers than for nonsmokers, while the probability of dying from emphysema is more than seven times as high. Among cigarette smokers in this age group, deaths resulting from heart and circulatory diseases are 50 per cent more frequent. ("A Canadian Study of Smoking and Health," Department of National Health and Welfare, 1966). Heart attacks and lung cancer rank as first and second causes of male deaths

for those between ages 45 and 64. Chronic bronchitis and emphysema join heart attacks and lung cancer as being among the top five causes of death for men aged 55 to 70 (Colburn and Baker, 1974). Table I lists the deaths attributable to the three major smoking-related diseases (Causes of Death - 1972, Ottawa: Information Canada, 1974).

TABLE I

DEATHS ATTRIBUTED TO SMOKING-RELATED DISEASES

IN CANADA - 1972

| Cause of Death | Male | Female | Total |
|---|---|---|---|
| Lung Cancer | 4,791 | 971 | 5,762 |
| Emphysema and Chronic Bronchitis | 2,488 | 540 | 3,028 |
| Ischemic Heart Disease | 30,788 | 19,331 | 50,119 |
| Total | 38,067 | 20,842 | 58,909 |

Unfortunately medicine can offer no cure for many of these disabling and fatal diseases. The only real solution is prevention.

As of 1970, it was estimated that over 50 per cent of the male population aged 20-64, and 34 per cent of the female population aged 20-64, were regular smokers (Bergin and Wake, 1960-72). Although there was an increase in the number of ex-smokers in both sexes between 1965 and 1970 in Canada, and a 5.7 per cent decrease in the number of male smokers, the incidence of smoking is increasing because of the

high recruitment rate among women and children.

> The 15-19 year age group accounted for virtually all of the change observed in smoking rates in females, with the incidence of regular smoking increasing in that group from 18.7% in 1965 to 24.9% in 1970. (+6.2%). (Bergin and Wake, 1960-72, p. 5).

While the proportion of Canadians smoking seems to be declining, the per capita consumption of tobacco seems to be increasing.

In a recent Canadian study by The Canadian Home and School and Parent-Teacher Federation (1971-72) for example, 4.8 per cent of eight year old males and 1.9 per cent of eight year old females were regular smokers. At 19 years of age, 55.5 per cent of the males, and 47.6 per cent of the females smoked. Unfortunately those who begin to smoke at an early age are more likely to suffer from the effects of smoking and to have a harder time quitting as well (Horn, 1963).

During the past fifteen years, considerable time and effort have been spent in attempting to develop an effective program in influencing adolescent and adult smoking behavior. Most of the research has dealt with providing the medical facts concerning the long-term harmful effects caused by cigarette smoking. Research on attitude change has suggested that when one is presented with information contrary to one's own beliefs and behavior, a cognitive imbalance or dissonance occurs (Festinger, 1957). One way of reducing this imbalance is to change the behavioral cognitive elements, i.e., change one's behavior to fit the information. If one smokes and is presented with the medical facts about the hazards, one can stop smoking to reduce the dissonance. However, two other ways of reducing the

imbalance also exist. One may change the environmental cognitive element, i.e., distort or deny the perceived information. Lastly, one may add new cognitive elements to support one's own position and off-set the new information.

In the Canadian Home and School report mentioned earlier, it was found that less than half of the adolescents 14 years and over, who smoke at least one cigarette a week, knew that smoking causes lung cancer. The report states further that "while many smokers acknowledge that smoking can have harmful effects, few say that the publicity about harmful effects has reduced their inclination to smoke (p. 30).

Morison (1960-68) points out the fact that the heavy smokers of 1968 had indicated awareness of the health hazards related to smoking in his 1963 survey, but that this awareness had had little impact upon their actual smoking behavior. On the other hand, another recent Canadian study has shown that a student-led program was effective in changing attitudes towards smoking as well as smoking behavior (Piper et al., 1971). Few researchers have had a major success with their programs emphasizing health hazards.

## I. HISTORY AND BACKGROUND OF PRESENT STUDY

After over 40 years as a practising thoracic surgeon, Dr. Herbert Meltzer, F.A.C.S.; F.R.C.S.; a founder member of the American Board of Thoracic Surgeons, is totally convinced that efforts must be concentrated upon prevention rather than a cure in combating the

health hazards of smoking tobacco. In 1969, Dr. Meltzer expressed his interest in speaking to young students about smoking and health. As a result, arrangements were made through the Edmonton Public School Board for him to address thirty different schools during the 1969-70 school year. The following year, a more comprehensive plan of attack was devised, and the voluntary services of Dr. Sproule, Professor of Medicine in charge of Chest Diseases at the University of Alberta, Dr. G. F. MacDonald of the Pulmonary Function Laboratory at the General Hospital and Dr. Burchak of Pediatric Services in the Charles Camsell Hospital were enlisted. Between the four doctors, all the junior high schools of the Public and Separate School Systems were visited. Presentations consisted of a brief lecture, a film: "A Breath of Air," and a question and answer period. Grades seven and eight were usually included, and in certain cases, grade nine.

During 1972-73 the decision to participate in the program was left to each school principal. If a principal requested a presentation, Dr. Meltzer provided one. Although the reactions and opinions of the majority of students, teachers and parents appeared favorable, Dr. Meltzer felt the need for an objective evaluation of the effectiveness of the "hard-medical facts" approach in changing attitudes and actual smoking behavior. If it is effective, then the program should be carried out more systematically and with greater cooperation from the schools and health organizations. If it is not effective, alternative health education programs must be developed.

In May 1971, Dr. Meltzer approached the federal Department of

National Health and Welfare and offered his services voluntarily in coordinating an intensive educational campaign and research study involving junior high school students. After considering the proposal, the federal department informed him that such a study was actually a provincial responsibility. Consequently, in the fall of 1972, the Provincial Minister of Health was contacted. Negotiations between the Provincial Department of Health and the Federal Department, Smoking and Health Division, began in October 1972, to establish that the provincial department would control the project while the federal department would fund the program. In June 1973, plans were finalized for a three year research study. After funds were authorized and released the proposal was initiated in January 1974. Grade seven students were chosen, for at this age level, many students begin to experiment with tobacco. These students will subsequently be followed through grades eight and nine.

The present study, a pilot study, was the first phase of the three year program. The purpose was to examine general trends of student smoking, and to indicate what kind of an effect the health education program was having.

## II. DESIGN OF THE STUDY

The present study surveys the smoking behavior of grade seven students in an urban setting and attempts to examine the effectiveness of the "hard medical facts" approach in deterring young people from smoking, increasing their knowledge about the health hazards,

and in promoting a more negative attitude towards smoking. Pre-test questionnaires measuring attitudes and smoking behavior were administered to three groups, consisting of one control and two experimental groups. One experimental group received a single smoking presentation while the second experimental group received an intensive program. The control group received no treatment program. Lastly, the groups received the post-test questionnaire.

## III. OVERVIEW OF THE STUDY

In Chapter I the topic of this study was introduced and the purpose and importance of it was established. Chapter II provides an overview of related literature including characteristics of adolescent smoking behavior, the influence of parental, sibling and peer smoking behavior, the effective use of role models, achievement orientation of smokers, a survey of attempted educational programs, and considerations for program development. Lastly, the theory of cognitive dissonance is briefly reviewed as it applies to smoking behavior. The design and procedure of the experiment are described in detail in Chapter III. Chapter IV is an analysis of the data obtained, and Chapter V is a discussion of the results which draws conclusions and makes suggestions for future study.

# CHAPTER II

## REVIEW OF THE RELATED LITERATURE

### I. SURVEY: CHARACTERISTICS OF ADOLESCENT SMOKING BEHAVIOR

Smoking surveys since 1960 have shown an increase in smoking behavior at all grade levels for both sexes. Children are beginning to smoke at an earlier age--the increase being most noticeable in the elementary school grades. When broken down into sexes, the increase in most pronounced among females, though girls still smoke relatively less heavily than the boys. Females show less concern about the health hazards of smoking and consequently, alter their habits less. (Morison, 1960-68; Morison and Medovy, 1961; Bajda, 1964; Briney, 1967; C.H.S.P.T.F., 1971-72; Ashley, 1972; Lanese, 1972).

In 1961, Morison and Medovy, studying Canadian students in grades 5-12, found that a considerable number smoked their first cigarette as early as six years of age. In the elementary grades, 40 per cent of the boys and 18 per cent of the girls had experimented with tobacco. In junior high school, 15.5 per cent of the girls and 25.4 per cent of the boys were already regular smokers, while in high school, 28.2 per cent of the girls and 44.7 per cent of the boys were regular smokers. The greatest increase in regular smoking in 1961 occurred between the ages of 13 and 16 years. A student-initiated survey in the United States found that the peak years for initiation into smoking were grade 8 for the boys and grade 9 for the girls. (Bajda, 1964). Morison (1960-68) found that over an eight-year period,

there was a 2 per cent increase in the number of regular male smokers, and a 13 per cent increase in regular female smokers at the high school level. At the junior high level, there was a 3 per cent increase in regular male smokers, and a 14 per cent increase in female smokers. In grades five and six, regular male smokers increased by 7 per cent, and female smokers by 3 per cent.

A recent Canadian study states that 4.8 per cent of the male and 1.9 per cent of the female eight year olds smoke one or more cigarettes per week, and by nineteen years of age, 55.5 per cent of the males and 47.7 per cent of the females are considered regular smokers. Examining heavy smokers (1 pack or more a week) one finds that between the ages of 8-10, 7 per cent of the boys and 3 per cent of the girls qualify. By seventeen years of age, 72 per cent of the boys, and 55 per cent of the girls are considered heavy smokers (C.H.S.P.T.F., 1971-72).

## II. THE INFLUENCE OF PARENTAL SMOKING BEHAVIOR

The highest proportion of regular adolescent smokers has been found to occur in families in which both parents smoke, while the lowest smoking rates of children are found in families in which neither parent smokes (Horn et al., 1959; Mausner and Mischler, 1966; Briney, 1967; Fodor et al., 1968; C.H.S.P.T.F., 1971-72; Lanese, 1972). More specifically, if both parents smoke, the chances that the child will smoke nearly double. The son seems to be more influenced by the model of the father, the daughter by the model of the mother (Horn

et al., 1959; Barret, 1962; Wahlford, 1970).

> Moderate parental smoking seemed to influence the children most, although heavy parental smoking had more effect upon girls, especially when it was done by the girls' mothers. In every income bracket, a higher percentage of children smoked than parents smoked (Bajda, 1964, p. 444).

Salber and MacMahon (1961) found that in families where neither parent smoked, 25 per cent of the students surveyed smoked; whereas, in families in which both smoked, 50 per cent of the students smoked. Further, in families in which only one parent smoked, nearly as many children smoked as in families in which two parents smoked. It would seem then, that the major determinant of parental influence is whether or not one parent smokes, since the degree to which the rate of adolescent smoking increases with the addition of a second parent smoking, is not nearly as great as the difference between the rate when neither smokes, and at least one smokes.

What of the effect of parental prohibitions towards smoking? Horn (1963) writes that

> . . . roughly 8% of all high school smokers smoke despite parental prohibitions against smoking--these being the attitudes of both parents as reported by students. More girls than boys show this kind of rebellious smoking and there is somewhat more defiance against paternal prohibition than against maternal prohibitions (p. 385).

## III. SIBLING AND PEER INFLUENCE

A direct correspondence between adolescent smoking and older sibling smoking behavior has been found (Horn, 1960; 1963; Fodor et al., 1968; Lanese, 1972). In fact, Lanese (1972) found that older

sibling influence is a more important consideration than parental influence. Horn's data showed that 36 per cent of the high school students smoked if at least one older sibling did, while if at least one older sibling did not smoke, only 17 per cent of the students smoked. There is an increased chance of being a smoker if one has an older sibling who smokes, rather than having older siblings who don't smoke, or not having older siblings at all. Salber et al (1963) found that an older sibling who does not smoke has a possible deterrent effect upon the younger siblings. As to the sex of the older sibling,

> . . . there is no evidence that the risk of smoking varies with the sex of the older sibling, nor that similarity or difference of sex between the index child and his older sibling has any significance (Salber et al., 1963).

Peer group influence is also a factor to consider (Bajda, 1964; Briney, 1967; Lanese et al., 1972). A student with a best friend who smokes is 9 times more likely to smoke himself, and as the reported number of friends who smoke increases, the chances of smoking himself increase. Lanese et al. (1972) found that

> . . . where all of one's pals smoke, the probability is 3 to 1 that the respondent himself smokes. Where none of one's pals smoke, the chances are one in a hundred that the respondent smokes (p. 808).

## IV. THE EFFECTIVE USE OF ROLE MODELS

Health education programs, in order to effect gains, must also involve the parents and adults who influence the children. Salber (1963) writes that

> . . . there is little hope of changing teenage habits unless the habits of parents and older (perhaps adult) siblings are changed (p. 572).

Morison (1964) adds that the leaders of youth, especially in sports and recreation, must be encouraged to accept responsibility for spreading the image that smoking is unfashionable, socially unacceptable and unhealthy.

> The finding that most children report they began to smoke as a result of the example of role models such as elder siblings and friends argues that countervailing personal influences should be employed to inhibit the onset of smoking. It is intriguing that most of our respondents gave pressures from a close friend as the sole force that they could envision as inhibiting their smoking (Mausner and Mischler, 1966; p. 66).

Further, if the health hazards of smoking are to be used as an appeal for not smoking, health must be seen as valued by the role models.

> For example, how effective would a teacher be on the subjects of cigarettes, drugs, or alcohol, if he were obviously neglecting his health through obesity or lack of exercise? (Hasenfus, 1971).

## V. SMOKING AND ACHIEVEMENT ORIENTATION

Less achievement-oriented than the non-smoker, the cigarette smoker seems to have lower academic goals (Horn et al., 1959; Horn, 1960; 1963; Bajda, 1964; Briney, 1967; Neuman, 1969; Fodor et al., 1968; C.H.S.P.T.F. 1971-72). Actual academic achievement was shown to have an inverse relationship with amount smoked, and this relationship was more marked for girls than for boys (Morison and Medovy, 1961). Barrett (1962) found that the majority of honor students were nonsmokers. In fact, "The highest percentage of smokers were awarded

a "D" academic achievement rating which means the student obtained less than 40 per cent and thus failed his grade examination" (p. 504). Finally, the study by Mausner and Mischler (1966) found those who smoked tended to have lower mean score in intelligence and in their grades; and there were more drop outs in school among smokers than nonsmokers.

Horn (1960, 1963) considers smoking to be a form of compensatory behavior for those who have failed to achieve peer group status. Newman (1969) examined the extent to which smokers as compared to nonsmokers could recognize their failure to achieve. Male and female smokers did not feel they came as close to meeting their parents' and schools' expectations as did nonsmokers. He found smokers more likely to fail, wishing to be older, and more likely to be truant or in trouble. Their grade-point average was also lower. Neuman suggests that either smokers misinterpret the expectations of parents and school, or actually do not meet these expectations. Consequently, smoking is compensatory behavior for those who do not achieve academically or socially. Many smoke to attain feelings of success, achievement and recognition. However, in contrast with Horn (1960, 1963), he found no difference between smokers and nonsmokers in perceiving themselves living up to peers' expectations. Recommending that educators should deal with the cause of the problem, failure, rather than with the result, smoking, Neuman states that educational programs should down-play the act of smoking, work on increasing feelings of self-worth of students and emphasize their potential. He suggests

that if this were done, the "crutch" of smoking would be less necessary. Hasenfus (1971) believes that educators must help adolescents substitute healthier coping activities for smoking, and focus on

> lessening the fear of failure, anxiety, tension, loneliness, the feeling of rejection, and other problems of the individual child (p. 373).

## VI. SURVEY: SMOKING EDUCATION PROGRAMS

In 1964, Morison did a survey of Winnipeg school children and developed a treatment program for two of the nine schools involved. The program included health education newsletters and the Report of the Royal College of Physicians of London on Smoking and Health. Further, school teachers, instructed by a team of specialists, were responsible for developing their own health programs. Students viewed two related films and discussed them. Medical personnel were used as resource persons on occasion. Parent meetings, community club meetings and sports club meetings were attempted; however, great indifference was the response. When the survey was repeated in a post-test situation, little change was found. In fact, fewer students than before had never tried cigarettes. In response to the question: "Has the publicity on the possible harmful effects of smoking decreased your tendency to smoke?" -- 55.4 per cent of the boys and 62.2 per cent of the girls replied "Yes."

In an eight year study, Morison et al. carried out three surveys--one in 1960, in 1964 and in 1968. A treatment program was given throughout this period to students in grades five to twelve. The

program was informal for the elementary students, and more formal for the older ones. It included lectures from medical personnel, films, health class presentations by teachers and student discussions. The results of the 1963 survey revealed that the majority did believe that smoking causes lung cancer and has harmful effects. Smokers, however, were less likely to accept these hazards as existing, and girls were less concerned and altered their behavior less. During the three year period, there had been an increase in the proportion of smokers. There was one success:

> . . . it was possible to effect a reduction in the number of regular smokers in a high school where the principal and teachers were enthusiastic about the education program and where student participation was active (p. 56).

Morison concluded that an intensive program can work but

> Its success depends upon many factors--the sincerity and dedication of the educators, the enthusiasm and cooperation of parents, teachers and youth leaders, and the degree to which the students can be convinced of the hazards of a lifetime habit of cigarette smoking and the many advantages of being a non-smoker (p. 54).

However, four years later, his survey showed an increase in smoking in all grades in both sexes, and a marked increase in female and elementary-school age children (Morison, 1960-68). He writes that ". . . these studies indicate that present efforts to reduce the smoking habit are ineffective at the school level" (p. 1,138).

Between 1960 and 1968, regular smokers in high school increased from 44 per cent to 46 per cent in the males, and from 28 per cent to 41 per cent in the females. As mentioned before, the heavy smokers of 1968 had indicated in 1963 that they were aware of the health

hazards of smoking.

An anti-smoking campaign was carried out in an all-boys high school several years ago (Monk, Tayback and Gordon, 1965). The program included the display of posters in the school, public addresses by researchers and doctors, leaflets, articles in the student newspaper, group discussions and letters sent home from the commissioner of health with a summary of research findings. The major focus was on the relationship between smoking and lung cancer. In both schools, the proportion of smokers increased in grade 10 and decreased in grades 11 and 12. There was no significant difference between the proportion of smokers in the experimental and control groups.

> With respect to the statement that smoking is dangerous to health, students exposed to the program were more likely to believe this at the end of the year than at the beginning (p. 7).

There were no other significant attitudinal changes.

In the most recent Canadian study, "Students and Smoking" (C.H.S.P.T.F., 1971-72), it states that

> While many smokers acknowledge that smoking can have harmful effects, few say that the publicity about these harmful effects has reduced their inclination to smoke. Only about 1 in 3 smokers . . . said his inclination was reduced, although 2 in 3 admitted that hazards exist. . . . Approximately half the non-smokers gave the harmful effects (presumably) as a reason for not smoking (p. 30).

Five different approaches in an anti-smoking program were examined by Daniel Horn (1960). Comparisons were made between the effectiveness of a contemporary approach, emphasizing current aspects of interest about smoking, such as reduced ability in sports, the

cost, and aesthetic reasons, a remote approach, emphasizing the relationship between smoking and diseases that appear later in life such as lung cancer, a two-sided, pro and con approach, an authoritative approach, and an adult role-taking approach involving student presentations. The results suggest that the "remote" approach is the most effective program for males, while both the remote and contemporary are effective for females. The second most effective approach for both sexes is the both-sided one. There was no significant difference between the effectiveness of the other methods; however, it is interesting to note that the authoritative program had a higher recruitment rate of new smokers than did the control group for females. Further, among females, it was found that parental prohibition yielded more smokers than did strong disapproval. About 10 per cent of high school students smoked despite parental prohibition but females were more defiant. In summary, the most effective treatment methods were ones which relied upon a logical, rational approach.

In contrast to the former study, Lambert et al., (1966) believes that in certain instances, the most effective anti-smoking appeal may be made on moralistic grounds rather than on cold, objective scientific facts. This study recommends that for younger children, especially in lower socioeconomic classes, anti-smoking arguments should suggest that smoking is immature behavior, and is silly.

> At the younger age group, when moralistic issues seem to be more cogent and immediate--'smoking is dirty,' or 'My parents don't want me to smoke'--and there is a willingness to take a stand, these may be the issues to present. In fact, significantly more non-smokers disagreed strongly with the statement

> 'It's all right for my parents to smoke.' Our findings further indicate that the 'attack' should be directed more toward younger children from the lower social classes (p. 9).

In determining the effectiveness of the student-centered educational method, it was found that student symposiums were more successful in the eighth grade than the eleventh grade. By grade 11, adolescents are less influenced by their peers (Merki, Creswell, Stone, Huffman, Newman, 1968). In another study, the effect of the teacher and three different classroom approaches were examined (Irwin, 1969). The focus of the message, smoking is hazardous to health, was presented in an individual approach where the child sought out information for a report; in a teacher-led approach and a peer-led approach. When there were good discussions, the teacher-led program was the most effective. However, in small classes, peer-led projects were more effective. Further, regular teachers were more effective than special teachers who prepared a lecture.

Piper et al. (1971) obtained encouraging results using student-directed projects. Opinion leaders from schools were chosen to attend a health seminar on smoking at the University of Saskatchewan. They were instructed to plan educational programs for their schools. In the grade 8 classes studied, "the proportion of current smokers decreased, ex-smokers increased and the proportion of non-smokers remained steady for boys and decreased for girls" (p. 436). There was a significant increase in the awareness of health hazards and a greater appreciation of the importance of these hazards. It is still

too early to see whether the behavioral changes are long-term.

## VII. PROGRAM DEVELOPMENT: CONSIDERATIONS

Several researchers have made suggestions concerning the development of adequate anti-smoking programs. Mausner and Mischler (1966) recommend that the

> . . . first step in the development of an anti-smoking program should be intensive investigation of the factors that favor the initiation and continuation of smoking (p. 61).
>
> In a differentiated program for control of smoking the supports for smoking should be analysed, and a persuasive appeal developed that is relevant to the individual's own patterns (p. 65).

They identify three dimensions which seem relevant to the continuation of smoking behavior: the saliency to one's emotional life, i.e., how pleasurable it is and whether it reduces tension; the social dimension of smoking; and thirdly, one's self definition which includes the act of smoking. The ten most significant reasons school children gave for smoking were identified by Eugene Levitt (1971):

1. pleasure
2. habit
3. peer influence
4. emotional improvement
5. to impress others
6. to imitate adults
7. eating substitute
8. general improvement
9. imitate siblings
10. rebellion

On the other hand, the major reasons for attempting to quit, given in descending order of significance, include health reasons, the expense, the influence of others, and parental influence (Bajda, 1964).

To create an effective anti-smoking program, one must identify what type of smoker the person is and develop the program accordingly, for the program must be tailored to fit the individual. Davis (1968)

identifies four types of smokers. First there is the habitual smoker who experiences neither positive nor negative feelings from smoking. This is the easiest type in which change can be effected. There is also the smoker who achieves positive effects from smoking and finds it a pleasurable experience. This is the second easiest type to change. Thirdly, is the person who smokes to reduce negative feelings and tension and attains a sedative effect. Lastly, is the addicted smoker who smokes for the positive reasons and to reduce negative feelings of stress. This type is the most difficult to change.

Davis offers four different appeals which may motivate one to quit smoking. Some will work better with certain people. Health reasons may be relevant to some, while economic reasons--the expense of smoking--may motivate others. Significant others modelling non-smoking behavior may be effective in influencing some people. The idea of self-control and mastery may impress other smokers.

Rotter (1971) writes about the internally-directed versus externally-directed person. Being internally-directed, one is confident that he has control in his life, that he can effect change, while being externally-directed, one lacks confidence in his own power and believes that fate plays a major role in his life. Rotter has found that the internals are more able to give up smoking than the externals. Consequently an anti-smoking program which does not discriminate between these two types of people may well be ineffective. Perhaps such psychological factors must also be considered in developing

treatment programs.

Further considerations are offered by Hochbaum (1968). A totally negative attitude towards smoking will not convince the adolescent, because he probably does experience some positive effects such as release of tension, relaxation, and more poise when smoking. Accept smoking as a normal means of coping; however, demonstrate that the health hazards far outweigh the benefits of this particular coping device. Attitudes, suggests Hochbaum, are rarely changed by a one-sided, aggressive attack. As stated earlier, prohibition for example, often leads to rebellious behavior. Present both viewpoints, allowing the child to make a responsible decision. Appeal to motives which are relevant and meaningful to him, and help him identify less hazardous means of achieving the same satisfactions. Behavior is unlikely to change on the basis of statistics--the facts must be made more real and personal. Medical advice and opinion can easily influence those who are indecisive about smoking and are being tempted. Further, experts as resource persons, and student-led discussions are advocated. Communicator credibility as a determinant of opinion change has been studied (Tong-He-Choo, 1964). Subjects were presented a communication advocating no causal relationship between smoking and lung cancer. Half the subjects read the information from a high credibility source while the others read it from a low credibility source. The high credibility source led to more change in attitudes than the low credibility source. Johnson and Scileppi (1969) have examined the effects of ego-involvement conditions on attitude change

to high and low credibility communicators. Under low ego involvement, the high credibility source does not affect comprehension of, or attention paid to the communication; however, it "operates as an evaluative 'set' influencing the subject's acceptance or rejection of the content of the communication" (p. 31). With low ego involvement there is no evaluating, while with high ego involvement, evaluation occurs under both low and high credibility sources. The effect of source credibility, then, disappears when one evaluates the message critically under high ego involvement conditions.

With regard to fear-arousing communications, Janis and Feshbach (1953) found that fear can lead to an avoidance of thinking about the information presented, unless the fear is reduced through some type of reassurance. Some evidence supports a defensive resistance hypothesis (Janis and Terwilliger, 1962). A strong threat communication seems less influential than a weak threat in changing attitudes towards smoking. Under a strong threat communication, there was a tendency to reject some of the information. Insko, Arkoff and Insko (1965) found that potential smokers were more influenced by a strong fear-arousing message concerning the detrimental effects of smoking, while actual smokers were more influenced by a weak fear arousing message. If a persuasive communication contains reassuring recommendations as to how the threat can be avoided, fear can be expected to facilitate attitudinal change (DeWolfe and Governale, 1964).

## VIII. THE THEORY OF COGNITIVE DISSONANCE

Festinger (1957) writes that ". . . two elements are in a dissonant relation if, considering these two alone, the obverse of one element would follow from the other" (p. 13). The magnitude of dissonance depends upon the importance of the elements and upon the proportion of relevant elements that are dissonant. For example, the more reasons known to a smoker for stopping smoking, the greater the cognitive dissonance created by continuing to smoke. The theory of cognitive dissonance postulates that dissonance or a state of imbalance creates discomfort and psychological tension, which motivates one to reduce the dissonance and attain consonance. Further, dissonance leads to definite actions to reduce it as well as attempts to avoid situations and information which would increase the dissonance. Three ways of reducing cognitive dissonance are described by Festinger. First, one may change the behavioral cognitive element. For example, if a smoker is presented with the facts about health and smoking, he may change his behavior and quit smoking in order to reduce the state of dissonance. Or he may deny his behavior or distort it. A second means of reducing the dissonance would be to change an environmental cognitive element. The smoker could deny or distort the information concerning smoking and its effect on one's health. Thirdly, he can add new cognitive elements in opposition to the other elements. By reading material which is critical of research linking smoking to cancer and other diseases, or seeking out information which states that the death rate from smoking is less than the death rate

from car accidents, the smoker can reduce the psychological tension and imbalance. Festinger found that the more people smoked, the more they refused to accept information dissonant with smoking. This was confirmed in a recent Canadian study involving school children.

> While non-smokers generally acknowledge that smoking is hazardous, the proportion of smokers who acknowledge the hazards of smoking is in inverse proportion to amounts smoked (C.H.S.P.T.F., 1971-72, p. 1).

Pervin and Yakto (1965) studied and compared fifty university smokers and fifty nonsmokers, to determine whether smokers reduce dissonance by minimizing the health information or reduce it through alternative methods. They found no difference between smokers and nonsmokers in the accuracy or recall of information about the health hazards. Therefore they assumed that there was little evidence of dissonance reduction through selective recall or avoidance of dissonant information. Smokers did question the validity of relevant studies more than nonsmokers; however, 92 per cent of the smokers agreed that there was statistical evidence for causal relationships between smoking and lung cancer. Both smokers and nonsmokers minimized deaths due to lung cancer among smokers. The data from their research study

> suggested that beyond questioning the validity of smoking--cancer studies, smokers reduce dissonance by minimizing the personal relevance of the danger. This is done by underestimating the dangerous level of cigarette consumption and by believing that a cure for cancer will come before the danger to them from smoking is greatest (p. 35).

Smokers tend to consider themselves light smokers, and minimize the discomforts accompanying smoking. They do not minimize dangers by

emphasizing other dangers in the world. Davis (1968) found that the health reasons against smoking were perceived as irrelevant to young smokers. Although aware of the threat, they did not experience it personally.

Investigating the relationships between the degree of concern over personal health (CPH) and preferences for smoking--relevant information and degree of endorsement of various beliefs about smoking, it was found that both smokers and nonsmokers show a preference for information consistent with their behavior (Canon et al., 1972). High CPH smokers evidenced highly selective exposure preferences, while low CPH smokers evidenced unbiased exposure. The high CPH smokers endorsed a variety of rationalizing beliefs about smoking.

Fodor and Glass (1968) found that their subjects, male smokers between the ages of 17 and 22 years, were often more informed than nonsmokers about the relationships between smoking and health. More smokers knew that smoking is implicated in heart disease and emphysema, that the Heart Association is against smoking and that smoking increases the heart rate. However, they felt the evidence was inconclusive and that moderate smoking is without risk for the normal, healthy person. Further, smokers felt that smoking could be beneficial at times, was a sign of individualism and was not a sign of weakness. Fewer smokers would advise young people not to smoke.

An important study by Lawton and Goldman (1961) focused upon groups of cancer researchers and medical personnel. As expected, more cancer scientists than the matched-control group of experimental

psychologists felt that smoking causes cancer. The lung cancer scientists did smoke less; however, they have always smoked less. Of those scientists who smoked and did believe in the causal relationship, 45 per cent did not quit.

> Involvement in lung-cancer smoking research per se, and the more intense opinions that it generates toward the controversy, did little to modify, or even make one desire to modify the smoking habit (p. 248).

And of those who did quit, health reasons were not given as the primary reason for quitting, suggesting rather strongly

> . . . the operation of stable psychophysiological motives which may act to counter the role that intellectual conviction plays in smoking, even in the intellectually oriented sample investigated in this study (p. 246).

Baer (1966) states that among the ex-smokers in his study, 100 per cent reported a strong belief in the relationship between smoking and lung cancer. Yet most smokers also agreed with the detrimental health effects. Therefore, health reasons were important but not sufficient to cause behavioral changes. As mentioned earlier, the heavy smokers of a 1968 survey had indicated awareness of the health hazards in 1963, yet had not quit smoking (Morison, 1960-68). In another study, 24 per cent of the girls who smoked, and 35 per cent of the boys, were trying to stop smoking for health reasons (Bajda, 1964). Levitt (1971) found that a major reason given for not smoking by adolescents was the health hazards, while Barrett (1962) found that 77.7 per cent of the smokers said they would be willing to stop if the health hazards were proved to them.

Several studies indicate that "smoking education must become

health education related to the total functioning and well-being of a person" (Fodor, Glass and Weiner, 1968). Unless children learn to have a broader concept of health, and understand the importance of health in life, and how it relates to the pursuit and attainment of happiness and goals, the presentation of the medical facts about health and smoking will have little effect upon them. That is unless health, itself, is valued, educational programs will be ineffective in influencing attitudes and behavior.

# CHAPTER III

## DESIGN AND PROCEDURE

### I. THE SAMPLE

A proportion of the grade seven students from eighteen junior high schools in the Edmonton Public School System was chosen to participate in this study. Between grades seven and nine, an increasing number of adolescents begin to experiment with smoking tobacco and become regular smokers. Dr. T. Blowers, Director of Research and Evaluation in the Edmonton Public School Board initially chose the schools which might be willing to participate. It was requested that as many grade seven students as possible be involved. Dr. Blowers selected schools and assigned them to the three groups in such a way, that each group was similar and representative in terms of geographic location, school size and socioeconomic factors. The decision to participate or not was left entirely to the principal of each school, and the final selection depended upon the availability and cooperation of each school. Of the eighteen principals approached, only one declined to participate, as his school was already heavily involved in several research projects. A substitute school was found to replace his school.

All students involved were administered the pre-test questionnaire during a two-week period in late January 1974, and were administered the same questionnaire again in a post-test situation in late May and early June 1974. Of these students, 1710 were administered

both the pre and post-test questionnaire and were included in the actual sample to be studied. Approximately 51 per cent of the students were males, and 49 per cent were females. Ages of the children ranged from ten years to fifteen years, with 94.2 per cent of them being either twelve or thirteen years old. The eighteen schools were divided into three groups of six schools each. Group A, consisting of 556 pupils, was the control group which did not receive any treatment program. Group B, an experimental group including 596* adolescents, received one lecture-film presentation by Dr. Meltzer during late April and during May. The film, "A Breath of Air," was followed by a short question-answer period. A little pamphlet entitled "Ten Little Smokers" was also distributed to provide additional information about the health hazards related to smoking. Lastly, Group C, the second experimental group of 558 students, attended five health programs by Dr. Meltzer, approximately one per month. Each presentation consisted of a short lecture, a film, and a question-answer period. The pamphlet "Do You Know What Happens When You Smoke?", a Reader's Digest Reprint, was also distributed to them.

## II. THE INSTRUMENT

A modified form of the questionnaire developed by Dr. G. W. Piper, Director and Medical Health Officer of the Department of Public Health in Saskatoon, and by Professor Wake of Carleton University (1969)

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*There is a slight discrepancy between the number of students in Groups B and C on the pre and post-test, probably attributable to a key punching error.

was used. Dr. Piper is using the questionnaire in a continuing study of the effectiveness of student-directed health programs (Piper et al., 1971; 1974). The few revisions introduced were made in consultation with Dr. J. G. Paterson, Professor at the University of Alberta in Educational Psychology, Dr. T. Blowers, Director of Research, Edmonton Public School Board, and Dr. W. Penner, Director of Evaluation, Edmonton Public School Board. This panel of experts also assured the face validity and content validity of the questionnaire.

Demographic data and attitudes towards smoking are the major areas of focus. The questionnaire includes multiple choice and agree-disagree questions. More specifically, the following content categories are included:

1. personal data: age, sex, plans for future education
2. family smoking patterns: parental and sibling smoking behavior
3. peer smoking patterns
4. student's perception of parents' attitudes towards smoking
5. personal smoking behavior
6. attitudes towards smoking.

## III. DEFINITIONS

The following operational definitions were used in order that the smoking classifications would be comparable to several other major studies on adolescent smoking behavior. Since adolescents generally smoke less heavily than adults, a heavy smoker in this study refers to someone smoking more than one pack a week.

a) regular smoker: one who smokes more than one cigarette a

week on a continuing basis.

b) experimental smoker: one who smokes less than one cigarette a week but continues to smoke.

c) ex-smoker: one who has been either an experimental or regular smoker but no longer smokes.

d) non-smoker: one who considers himself to be a non-smoker. The non-smoker may never have tried smoking, or may have experimented but did not continue to smoke.

## IV. ADMINISTRATION OF THE QUESTIONNAIRE

Questionnaires were taken by the researcher and several research assistants to each school and were administered to the students after a brief introduction as to the nature and purpose of the study. After the administration, questions from the students and teachers were answered, and it was mentioned that a summary of the results would be sent to the principal of each school upon the completion of the research project.

It was originally intended to have the students respond to the questionnaires anonymously; however, this was not possible since the students must be identified and followed through grades eight and nine. Consequently, it was necessary for them to write their names on their questionnaires. The names were then translated into the Edmonton Public School Board computer code numbers which include the child's first five letters of his name, his initials and birthdate. The need for identifying themselves was explained to them, and they were verbally assured that the individual results would be seen only by research assistants.

## V. DATA ANALYSIS AND THE HYPOTHESES

Simple descriptive statistics, i.e., frequency tabulations, percentages, and cross-tabulations have been used. The z values for independent proportions was used to test the null hypotheses that

1. There are no significant differences among the proportion of smokers in groups A, B, and C in the pre-test.

2. There are no significant differences on the post-test among the proportion of smokers in the control group A, in the group receiving one treatment program, group B, and in the group receiving an intensive treatment program, group C.

The z value for correlated proportions was used to test the null hypothesis that

3. There is no significant difference between the proportion of smokers within each group on the pre and post-test.

A negative attitude towards smoking score was determined for each subject depending upon how they responded to 28 of the 32 attitudinal statements. Scores ranged from 0 to 28. The higher the score, the more negative the attitude. Then a mean score was calculated for each group on the pre and post-test. Mean scores were also found for smokers within the three groups on the pre and post-test. The t-test for independent samples was used to test the following null hypotheses:

4. There are no significant differences among the mean negative attitude towards smoking scores of groups A, B and C on the pre-test.

5. There are no significant differences among the mean negative attitude towards smoking scores of the control group A, of group B,

which received a single treatment program and group C, which received an intensive program.

6. There are no significant differences among the mean negative attitude towards smoking scores of the smokers in groups A, B and C on the pre-test.

7. There are no significant differences on the post-test among the mean negative attitude scores of the smokers in the control group A, in group B which received a single treatment program, and in group C which received an intensive treatment program.

## VI. LIMITATIONS OF STUDY

1. Complete anonymity could not be assured. Consequently, some students verbalized their anxieties about completing the questionnaire. It can only be assumed that students answered truthfully.

2. Students were not randomly assigned to the control and two treatment groups.

3. The questionnaire was not as sensitive as it could have been to intensity of attitudes because only simple dichotomous responses were used (agree-disagree). A five-point scale would have been much more sensitive to attitude variance.

4. Within group attitudinal change and interactional effects were not examined.

# CHAPTER IV

## RESULTS

### I. CHARACTERISTICS OF SMOKING BEHAVIOR

The prevalence of smoking behavior of mid-year grade seven students in this study is shown in Tables II and III. Sex variables were taken into account.

It is indicated in Table II that, of those who responded, 38.3 per cent had never tried smoking, while 9.6 per cent had smoked over 100 cigarettes. Approximately equal percentages of males and females had smoked over 25 cigarettes.

In Table III, it is shown that 61.8 per cent of the students were non-smokers and 10.1 per cent were regular smokers. It was interesting to note that a greater percentage of girls than boys were regular smokers. Of the girls, 12.0 per cent smoked, while only 8.2 per cent of the boys smoked. Stated differently, 58.5 per cent of the regular smokers were females and 41.5 per cent were males. Further, a lesser percentage of girls than boys were non-smokers.

Specific information concerning the amount of tobacco consumed, as reported by regular smokers, is given in Table IV. Over one-third of the smokers smoked from 2-5 cigarettes daily while over one-quarter of them smoked more than one cigarette per week but less than one per day. Approximately 6 per cent of the regular smokers reported that they smoked between half a pack to a full pack of cigarettes a day.

TABLE II

NUMBER OF CIGARETTES SMOKED BY STUDENTS

| Amount Smoked | | Boy | Girl | Row Total |
|---|---|---|---|---|
| Never Smoked | Frequency Count | 323 | 327 | 650 |
| | Row Percentage | 49.7 | 50.3 | 38.3 |
| | Column Percentage | 37.4 | 39.3 | |
| | Total Percentage | 19.0 | 19.3 | |
| Just 1 Cigarette | As Above | 116 | 135 | 251 |
| | | 46.2 | 53.8 | 14.8 |
| | | 13.4 | 16.2 | |
| | | 6.8 | 8.0 | |
| >1 but < 10 | As Above | 158 | 140 | 298 |
| | | 53.0 | 47.0 | 17.6 |
| | | 18.3 | 16.8 | |
| | | 9.3 | 8.3 | |
| >10 but < 25 | As Above | 87 | 69 | 156 |
| | | 55.8 | 44.2 | 9.2 |
| | | 10.1 | 8.3 | |
| | | 5.1 | 4.1 | |
| >25 but < 100 | As Above | 93 | 86 | 179 |
| | | 52.0 | 48.0 | 10.6 |
| | | 10.8 | 10.3 | |
| | | 5.5 | 5.1 | |
| >100 | As Above | 87 | 75 | 162 |
| | | 53.7 | 46.3 | 9.6 |
| | | 10.1 | 9.0 | |
| | | 5.1 | 4.4 | |
| | Column | 864 | 832 | 1696 |
| | Total | 50.9 | 49.1 | 100.0 |

Number of Missing Observations = 14

TABLE III

FOUR CATEGORIES OF STUDENT SMOKERS -- MALE AND FEMALE

| Type of Smoker | | Boy | Girl | Row Total |
|---|---|---|---|---|
| Non-Smoker | Count | 553 | 497 | 1050 |
| | Row Percentage | 52.7 | 47.3 | 61.8 |
| | Column Percentage | 63.9 | 59.7 | |
| | Total Percentage | 32.6 | 29.3 | |
| Ex-Smoker | As Above | 177 | 181 | 358 |
| | | 49.4 | 50.6 | 21.1 |
| | | 20.4 | 21.8 | |
| | | 10.4 | 10.7 | |
| Experimental | As Above | 65 | 54 | 119 |
| | | 54.6 | 45.4 | 7.0 |
| | | 7.5 | 6.5 | |
| | | 3.8 | 3.2 | |
| Regular Smoker | As Above | 71 | 100 | 171 |
| | | 41.5 | 58.5 | 10.1 |
| | | 8.2 | 12.0 | |
| | | 4.2 | 5.9 | |
| | Column | 866 | 832 | 1698 |
| | Total | 51.0 | 49.0 | 100.0 |

Number of Missing Observations = 12

TABLE IV

CONSUMPTION OF CIGARETTES BY REGULAR SMOKERS IN GRADE 7

| Amount Smoked | Frequency Count | Percent |
|---|---|---|
| > 1 per week < 1 per day | 49 | 28.7 |
| 1 per day | 32 | 18.7 |
| 2 - 5 per day | 62 | 36.3 |
| 6 - 10 per day | 17 | 9.9 |
| .5 - 1 pack per day | 10 | 5.8 |
| > 1 pack per day | 1 | 0.6 |
| Total | 171 | 100.0 |

## II. PARENTAL INFLUENCE OF SMOKING BEHAVIOR

The smoking behavior of their parents, as reported by the students themselves, is outlined in Table V.

Among the parents, 12.6 per cent more fathers than mothers smoked. However, among their children, 3.8 per cent more girls than boys smoked. Table VI cross-tabulates the percentage of non-smokers and smokers with parental smoking behavior.

A greater percentage of smokers than non-smokers had both parents smoking, while a lesser percentage of smokers had neither parent smoking. Table VII includes sex variables and only the four major parental smoking variables.

TABLE V

PARENTAL SMOKING BEHAVIOR IN PERCENTAGES

| Type of Smoker | Father | Mother |
|---|---|---|
| Smoker | 53.5 | 40.9 |
| Non-Smoker | 27.4 | 46.8 |
| Ex-Smoker | 15.0 | 11.2 |
| No Response | 4.1 | 1.1 |
| | 100.0 | 100.0 |

TABLE VI

PERCENTAGE OF NON-SMOKERS AND SMOKERS CROSS-TABULATED WITH PARENTAL SMOKING STATUS

| Type of Smoker | Both Parents Smoke | Only 1 Parent Smokes | Neither Smokes |
|---|---|---|---|
| Non-Smoker * | 24.5 | 28.1 | 24.9 |
| Smoker ** | 41.8 | 24.1 | 9.5 |

* N = 1009

** N = 158

TABLE VII

PERCENTAGE OF BOY AND GIRL SMOKERS AND NON-SMOKERS CROSS-TABULATED WITH PARENTAL SMOKING

| Parental Smoking | Boy Non-Smoker | Boy Smoker | Girl Non-Smoker | Girl Smoker |
|---|---|---|---|---|
| Mother only smokes | 23.0 | 7.5 | 5.8 | 11.0 |
| Father only smokes | 22.6 | 14.9 | 20.5 | 14.3 |
| Both smoke | 23.0 | 40.3 | 26.1 | 42.9 |
| Neither smoke | 25.3 | 9.0 | 24.3 | 9.9 |
| | N = 526 | N = 67 | N = 482 | N = 91 |

Again the data revealed that the percentage of regular smokers was most affected when either both parents smoked or neither smoked. The girl smoker appeared to be more influenced by the model of her father's smoking behavior, than the boy smoker was by his mother's smoking. A smaller proportion of boys smoked than girls when only the mother smoked, but an approximately equal proportion of males and females smoked when only the father smoked. Lastly, few of the female non-smokers had only a mother who smoked, indicating that the mother's smoking behavior had a strong influence on the daughter. If only the mother smoked, the daughter was more likely to be smoking, herself.

Of the students surveyed, approximately 13 per cent responded that both their parents forbid smoking. Within this particular group of adolescents, 7.5 per cent were regular smokers and 4.2 per cent were experimenting with tobacco. In addition, 15.9 per cent reported

that they had quit smoking cigarettes while 72.4 per cent said they were non-smokers. The proportion of regular smokers in these families which strongly forbid smoking is not much different than the proportion of regular smokers in the total sample (10.1 per cent).

## III. SIBLING INFLUENCE

Cross-tabulations done between student smoking behavior and older sibling smoking behavior indicated that 41.8 per cent of the regular smokers had at least one older brother who smoked, and 46.9 per cent had at least one older sister who smoked. Among the non-smokers, only 14.9 per cent had an older brother who smoked and 18.3 per cent had an older sister who smoked. Approximately 33 per cent of the non-smokers had neither an older brother nor an older sister. Only 14 per cent of the smokers were in the same category. Not having older siblings seemed to have a deterrent affect upon smoking behavior. Although one older sibling smoked, having another one who did not smoke seemed to have an inhibitory effect upon the younger child's smoking behavior. A greater proportion of regular smokers had only one older sibling who smoked rather than one who smoked and one who did not. Tables VIII and IX give more specific information about older sibling influence.

## IV. PEER INFLUENCE

When one's best friend smoked, 18.3 per cent predicted that they themselves would definitely not be smoking in three years time,

TABLE VIII

PERCENTAGE OF STUDENT SMOKERS AND NON-SMOKERS WITH THEIR OLDER BROTHERS' SMOKING STATUS

| Student Smoking Status | 1 Smokes 1 Doesn't | 1 Smokes | 1 Does Not | 1 Quit Smoking | No Older Brother |
|---|---|---|---|---|---|
| Non-Smoker* | 4.8 | 10.1 | 27.3 | 2.6 | 55.2 |
| Regular Smoker** | 10.3 | 31.5 | 12.9 | 6.7 | 37.6 |

* N = 1029 ** N = 165

TABLE IX

PERCENTAGE OF STUDENT SMOKERS AND NON-SMOKERS WITH THEIR OLDER SISTERS' SMOKING STATUS

| Student Smoking Status | 1 Smokes 1 Doesn't | 1 Smokes | 1 Does Not | 1 Quit Smoking | No Older Sister |
|---|---|---|---|---|---|
| Non-Smoker* | 3.3 | 15.0 | 27.6 | 2.5 | 51.6 |
| Regular Smoker** | 6.8 | 40.1 | 13.0 | 5.6 | 34.6 |

* N = 1029 ** N = 162

37.5 per cent predicted that they probably would not, 41.2 per cent predicted they probably would, and 3.0 per cent predicted they definitely would be smoking. Among regular smokers with a best friend who smoked, 63.5 per cent predicted they would probably be smoking in three years. However, among regular smokers with a best friend who

did not smoke, only 52.2 per cent predicted they might be smoking. Among the experimental smokers with a best friend who smoked, 44.3 per cent predicted they would be smoking, but among those with a best friend who did not smoke, only 25.5 per cent predicted they probably would be smoking in three years time. Examining the non-smokers with a non-smoker best friend, one found that 66.2 per cent said they definitely would not be smoking, and 28.6 per cent said they probably would not be smoking. Only 4.9 per cent predicted they might be smoking. Yet when the non-smoker's best friend did smoke, there was quite a change. Only 35.4 firmly predicted that they definitely would not be smoking, 53.2 per cent predicted they probably would not, but 10.1 per cent said they probably would, and 1.3 per cent predicted they definitely would be smoking.

If none of one's group of friends smoked, 67.1 per cent declared that they definitely would not be smoking three years in the future, while 27.0 per cent said they probably would not. Only 5.9 per cent predicted they might be smoking. However, when one-half to three-quarters of one's friends smoked, the statistics altered dramatically. Now only 13.0 per cent firmly believed they would not be smoking and 35.7 per cent stated they probably would not smoke. But 47.0 per cent predicted that they probably would be smoking. 4.3 per cent were definite that they would smoke.

Table X gives the percentage of different types of smokers who predicted they would probably be smoking in three years and cross-tabulates this data with the number of their friends who smoked. For

TABLE X

TYPES OF SMOKERS CROSS-TABULATED WITH THE NUMBER OF THEIR FRIENDS WHO SMOKE WITH THE PERCENTAGE PREDICTING THEY WILL PROBABLY SMOKE IN THREE YEARS

| Number of Friends Who Smoke | Non-Smoker | Ex-Smoker | Experimental Smoker | Regular Smoker | Total |
|---|---|---|---|---|---|
| None | 4.1 of 684 | 13.9 of 108 | 25.0 of 16 | 25.0 of 16 | 812 |
| < 1/4 | 4.7 of 258 | 22.1 of 122 | 22.2 of 36 | 52.6 of 36 | 435 |
| 1/4 - 1/2 | 14.5 of 69 | 33.9 of 59 | 54.5 of 22 | 64.3 of 22 | 178 |
| 1/2 - 3/4 | 31.3 of 16 | 26.7 of 30 | 54.2 of 24 | 62.2 of 24 | 115 |
| > 3/4 | 5.0 of 20 | 44.1 of 34 | 30.0 of 20 | 64.9 of 20 | 148 |
| TOTAL | 1047 | 353 | 118 | 170 | 1688 |

the regular smokers, there was a steady increase in those predicting smoking behavior as the number of their friends who smoked also increased. However, it was interesting to note a different trend among the non-smokers and experimental smokers. The percentage of non-smokers who believed they would be smoking increased until three-quarters of their friends were smoking. But when over three-quarters of their friends smoked, the percentage of non-smokers who pictured themselves as smokers in the future dropped from 31.3 per cent - 5.0 per cent. A similar trend was apparent among the experimental smokers (54.2 per cent - 30.0 per cent). Perhaps those who associated predominantly with smokers, were more aware of the detrimental effects of smoking tobacco and of the difficulty in quitting once smoking had become habitual. Seeing a large number of their close friends experiencing problems related to smoking--financial, health or otherwise, may have had a deterrent effect upon them.

## V. ACADEMIC ORIENTATION

Table XI compares the percentage of smokers and non-smokers with their intentions for further education. Almost

20 per cent more non-smokers than regular smokers stated that they were planning to attend university. Among the non-smokers, 67.7 per cent felt they would take some kind of further training after high school--perhaps university, vocational or some technical training. Only 50.6 per cent of the regular smokers indicated similar intentions.

Approximately 13 per cent more smokers than non-smokers planned only on finishing high school at this point in their career.

TABLE XI

PERCENTAGE OF NON-SMOKERS AND SMOKERS WITH VARIOUS PLANS FOR FURTHER EDUCATION

| Type of Smoker | Not Finish High School | Only Finish High School | Technical, Vocational | University | Don't Know |
|---|---|---|---|---|---|
| Non-smoker | 0.3 | 18.4 | 9.4 | 58.3 | 13.5 |
| Regular Smoker | 2.9 | 31.2 | 11.8 | 38.8 | 15.3 |

## VI. HYPOTHESIS TESTING

The first two hypotheses were stated in the null form as follows:

Hypothesis 1. There are no significant differences among the proportion of smokers in groups A, B and C on the pre-test.

Hypothesis 2. There are no significant differences on the post-test among the proportion of smokers in the control group A, in the group receiving one treatment program, group B, and in the group receiving an intensive treatment program, group C.

The value for independent proportions was used to test these null hypotheses. The results are reported in Tables XII and XIII. The obtained values were not statistically significant at the .05 level. Consequently, neither of the null hypotheses were rejected.

TABLE XII

PROPORTION OF SMOKERS IN THE CONTROL AND TREATMENT GROUPS ON THE PRE-TEST AND POST-TEST

| Test Situation | Proportion of Smokers in Groups | | |
|---|---|---|---|
| | Control Group A | Treatment Group B | Treatment Group C |
| Pre-Test | .109 | .096 | .097 |
| Post-Test | .114 | .125 | .141 |

TABLE XIII

z VALUES FOR SIGNIFICANCE OF DIFFERENCES BETWEEN PROPORTION SMOKERS IN THE CONTROL AND TREATMENT GROUPS ON THE PRE AND POST-TEST

| Groups Tested | Pre-test | | Post-test | |
|---|---|---|---|---|
| | z | p | z | p |
| Control Group A<br>Treatment Group B | .65 | .3230 | -.55 | .3429 |
| Control Group A<br>Treatment Group C | .60 | .3332 | -1.29 | .1736 |
| Treatment Group B<br>Treatment Group C | -.05 | .3984 | -.76 | .2989 |

Hypothesis 3. There is no significant difference between the proportion of smokers within each group on the pre and post-test.

The z value for correlated proportions was used to test the null hypothesis. The results are reported in Tables XIV through XVII. The obtained value for group A was not significant at the .05 level and the null hypothesis that there was no significant difference between the proportion of smokers in group A on the pre and post-test was not rejected. However, the obtained values for groups B and C were statistically significant at the .05 level. Consequently, the null hypothesis was rejected for groups B and C.

TABLE XIV

NUMBER AND PROPORTION OF SMOKERS IN GROUP A

ON THE PRE AND POST-TEST

| | | Post-Test | | |
|---|---|---|---|---|
| | | Others | Smokers | Total |
| Pre-Test | Smokers | 23 (.042) | 37 (.067) | 60 (.109) |
| | Others | 465 (.844) | 26 (.047) | 491 (.891) |
| | Total | 488 (.886) | 63 (.114) | 551 (1.000) |

TABLE XV

NUMBER AND PROPORTION OF SMOKERS IN GROUP B

ON THE PRE AND POST-TEST

| | | Post-Test | | |
|---|---|---|---|---|
| | | Others | Smokers | Total |
| Pre-Test | Smokers | 19 (.032) | 38 (.064) | 57 (.096) |
| | Others | 501 (.843) | 36 (.061) | 537 (.904) |
| | Total | 520 (.875) | 74 (.125) | 594 (1.000) |

TABLE XVI

NUMBER AND PROPORTION OF SMOKERS IN GROUP C

ON THE PRE AND POST-TEST

| | | Post-Test | | |
|---|---|---|---|---|
| | | Others | Smokers | Total |
| Pre-Test | Smokers | 16 (.028) | 38 (.069) | 54 (.097) |
| | Others | 460 (.831) | 40 (.072) | 500 (.903) |
| | Total | 476 (.859) | 78 (.141) | 554 (1.000) |

TABLE XVII

Z VALUES FOR SIGNIFICANCE OF DIFFERENCES BETWEEN PROPORTION

OF SMOKERS WITHIN EACH GROUP ON THE PRE AND POST-TEST

| Group | Z Value | Probability |
|---|---|---|
| A | .43 | .3637 |
| B | 2.29 | .0290* |
| C | 3.21 | <.0044* |

*Significant at the .05 level

Hypothesis 4. There are no significant differences among the mean negative attitude towards smoking scores of groups A, B and C on the pre-test.

The t-test for independent samples was used to test the null hypothesis of no significant difference in means. The results are given in Tables XVIII and XIX. No significant difference was found between the means of groups A and C at the .05 level; however, significant differences at the .05 level were found between the means of groups A and B, and groups B and C. The null hypothesis of no significant difference between means was not rejected for groups A and C, but was rejected for groups A and B, and B and C. It cannot be assumed, therefore, that group B was drawn from a population having the same mean as the populations from which groups A and C were drawn.

TABLE XVIII

NEGATIVE ATTITUDE TOWARDS SMOKING MEANS AND STANDARD DEVIATIONS FOR GROUPS ON THE PRE-TEST

| Group | Mean | Standard Deviation |
|---|---|---|
| A | 21.06 | 4.59 |
| B | 20.46 | 5.09 |
| C | 21.51 | 4.60 |

TABLE XIX

T-TESTS FOR THE SIGNIFICANCE OF DIFFERENCE BETWEEN NEGATIVE ATTITUDE TOWARDS SMOKING MEANS OF GROUPS ON THE PRE-TEST

| Groups Tested | t | df | p |
|---|---|---|---|
| A and B | 2.11 | 1150 | .0431 |
| B and C | -3.68 | 1152 | < .001 |
| A and C | -1.64 | 1112 | .1040 |

Hypothesis 5. There are no significant differences among the mean negative attitude towards smoking scores of the control group A, of group B, which received a single treatment program and group C, which received an intensive program.

The t-test was used to test the null hypothesis of no significant difference in means. Since group B had a significantly different mean compared to groups A and C on the pre-test, it was excluded from analysis on the post-test. Results are reported in Table XX. The obtained value was statistically significant at the .05 level. In fact, p is < .001.

The null hypothesis of no significant difference between the mean negative attitude towards smoking scores of groups A and C was

TABLE XX

MEANS AND STANDARD DEVIATIONS OF GROUPS A AND C ON THE POST-TEST WITH THE RESULTS OF THE T-TEST FOR SIGNIFICANCE OF DIFFERENCES BETWEEN MEANS

| Group Mean and Standard Deviation | t | df | p |
|---|---|---|---|
| Group A<br>$\bar{X}$ = 21.12<br>SD= 4.91 | 4.50 | 1113 | <.001* |
| Group C<br>$\bar{X}$ = 22.38<br>SD= 4.46 | | | |

*Significant at the .05 level

rejected. It was concluded that the difference in mean attitude scores resulted from the treatment applied to group C.

Hypothesis 6. There are no significant differences among the mean negative attitude towards smoking scores of the smokers in groups A, B and C on the pre-test.

The t-test was used to test the null hypothesis of no significant difference in means. Results are reported in Tables XXI and XXII. No significant differences were found between the means of groups A and C and between groups B and C at the .05 level; however, there was a significant difference between the means of groups A and B on the pre-test. The null hypothesis was not rejected for groups A and C,

and for B and C, but was rejected for groups A and B. It cannot be assumed that the smokers from groups A and B were drawn from populations having the same mean.

TABLE XXI

NEGATIVE ATTITUDE TOWARDS SMOKING: MEANS AND STANDARD DEVIATIONS OF SMOKERS IN GROUPS A, B AND C ON THE PRE-TEST

| Group | Mean | Standard Deviation |
|---|---|---|
| A | 15.70 | 4.78 |
| B | 13.77 | 5.03 |
| C | 15.26 | 4.29 |

TABLE XXII

T-TESTS FOR THE SIGNIFICANCE OF DIFFERENCE BETWEEN NEGATIVE ATTITUDE TOWARDS SMOKING MEANS OF SMOKERS IN GROUPS ON THE PRE-TEST

| Groups Tested | t | df | p |
|---|---|---|---|
| A and B | 2.14 | 115 | $.02 < p < .05$* |
| B and C | 1.67 | 109 | $.10 < p < .20$ |
| A and C | .52 | 112 | $> .20$ |

*Significant at the .05 level

Hypothesis 7. There are no significant differences on the post-test among the mean negative attitude scores of the smokers in the control group A, in group B which received a single treatment program, and in group C which received an intensive treatment program.

The t-test for independent samples was used once again to test the null hypothesis of no significant difference in means. Since groups A and B were significantly different on the pre-test, they were excluded from the analysis. The results are given in Tables XXIII and XXIV. A significant difference at the .05 level was found between the means of groups A and C, but not between groups B and C. Therefore the null hypothesis was not rejected for groups B and C, but was rejected for groups A and C. The difference in attitudes among the smokers in groups A and C can be attributed to the treatment applied to group C.

TABLE XXIII

NEGATIVE ATTITUDE TOWARDS SMOKING: MEANS AND STANDARD DEVIATIONS OF SMOKERS IN GROUPS ON THE POST-TEST

| Group | Mean | Standard Deviation |
|---|---|---|
| A | 14.95 | 5.28 |
| B | 15.77 | 5.02 |
| C | 16.94 | 5.27 |

TABLE XXIV

T-TESTS FOR THE SIGNIFICANCE OF DIFFERENCE BETWEEN NEGATIVE ATTITUDE TOWARDS SMOKING: MEANS OF SMOKERS IN GROUPS ON THE POST-TEST

| Groups Tested | t | df | p |
|---|---|---|---|
| A and C | 2.22 | 135 | .0339* |
| B and C | 1.00 | 150 | .1497 |

* Significant at .05 level

In addition to the hypotheses tested, it was decided to examine how students agreed and disagreed to the following three attitudinal statements:

a. Cigarette smoking is the leading cause of lung cancer.

b. Cigarette smokers are more likely to die from heart disease than people who don't smoke.

c. In smokers, the chances of getting chronic bronchitis or emphysema are much greater than in non-smokers.

These statements were chosen for several reasons. First, they are considered statements of fact by the medical profession and it would be interesting to see to what extent these facts were accepted by the students. Secondly, Dr. Meltzer discussed at length in his lectures, how these diseases--lung cancer, heart disease, chronic bronchitis and pulmonary emphysema were related to smoking tobacco. What impact this information had on the students in group C could be studied.

To test the significance of the difference of proportion of smokers and non-smokers who agreed to these statements, z values were used and significance at the .05 level for a one-tailed test was required. With regard to all three statements, a significantly greater proportion of non-smokers than smokers agreed to them on the pre-test. On the post-test as well, a significantly greater proportion of non-smokers than smokers in groups A, B and C, agreed to the statements. Smokers in group C, although provided with the same information as the non-smokers, agreed less with it, probably questioning its validity.

Next, chi-squares were used to determine whether or not there were relationships between groups of smokers (non-smokers, ex-smokers, experimental, and regular) from the three groups on the post-test, and how they responded to each question. For example, was there a relationship between non-smokers from groups A, B and C and how they responded to the first statement? Almost without exception, the observed frequencies of group B responses were very close to the expected frequencies. Consequently, group B was eliminated from further study and only groups from A and C were compared. Then z values for testing the significance of differences in proportions were used with a .05 level of significance required. The following findings were made:

a. A significantly greater proportion of non-smokers from group C than from group A agreed to all three statements (one-tailed test, $p < .05$).

b. There was no relationship between ex-smokers from groups A

and C on the post-test and how they responded to the statement about lung cancer. However, a significantly greater proportion of ex-smokers from group C than from group A agreed to the statements about smoking and heart disease, and bronchitis and emphysema. (one-tailed test, $p < .05$). The fact that smoking is related to lung cancer has been much more publicized. Consequently, this information was probably known and accepted by most ex-smokers before the treatment program and had little impact.

c. There was no relationship between experimental smokers in groups A and C on the post-test and how they responded to any of the three statements.

d. There was no relationship between the smokers from groups A and C on the post-test and how they responded to the questions about lung cancer or bronchitis and emphysema. However, a significantly greater proportion of smokers from group C than from group A agreed to the statement linking cigarette smoking and heart disease (one-tailed test, $p < .05$). With regard to the lung cancer statement, again, the availability of information about smoking and lung cancer may have affected the results. The presentation of this fact to group C smokers probably provided little new information. Further, even among young smokers, many would be familiar with the smoker's cough and the increased risk of colds and bronchitis. This aspect of

smoking may be more personally relevant to smokers in both groups. The facts about smoking and heart disease though, may have been new information to group C smokers, presented by a credible source, and was accepted by a large proportion of them.

# CHAPTER V

## DISCUSSION AND CONCLUSIONS

### I. SURVEY AND DESCRIPTIVE STUDY

The results of this descriptive survey study indicated that approximately 10 per cent of the students in the population involved were regular smokers, i.e., they smoked more than one cigarette per week. About 62 per cent of them were non-smokers. Although a greater proportion of the adolescents' fathers than mothers smoked, among the students, a greater proportion of girls than boys were regular smokers. Of the girls, 12.0 per cent were smokers, while only 8.2 per cent of the boys were smokers. The majority of grade seven smokers consumed five cigarettes or less each day.

The influence of parental smoking on their children's behavior was evident. The highest proportion of regular adolescent smokers occurred in families in which both parents smoked. When only one parent smoked or neither smoked, the percentage of smokers dropped perceptibly. These findings were consistent with a substantial body of research evidence (Horn et al., 1959; Mausner and Mausner, 1966; Briney, 1967; Fodor et al., 1968; C.H.S.P.T.F., 1971-72; Lanese, 1972). Among the non-smokers, there were no obvious trends concerning parental influence. Boys seemed less influenced by their mother's smoking than girls were by their father's smoking. In fact, boys and girls seemed equally influenced by the father's smoking behavior, for 14.9 per cent of the boys and 14.3 per cent of the girls had only a

father who smoked. Parental prohibitions against smoking did not seriously alter the proportion of regular smokers. There were some indications of rebellious smoking, in that 7.5 per cent of the students, who had both parents forbidding smoking, were regular smokers. The proportion of regular smokers in the total sample in the pre-test was 10.1 per cent.

A correspondence between adolescent smoking and older sibling smoking behavior was found. This supported the findings of Horn (1960, 1963), Fodor et al. (1968), and Lanese (1972). The majority of regular smokers had an older sibling who smoked. However, if one older sibling smoked but one did not, the proportion of smokers decreased considerably. Having an older sibling who did not smoke or having no older siblings seemed to have a deterrent effect, and greatly reduced the chances of being a smoker. Salber et al. (1963) also found that having an older sibling who did not smoke had a deterrent effect upon the younger siblings.

Among all the categories of smokers, when one's best friend smoked, a greater proportion predicted that they, themselves, would be smoking in three years' time. When none of one's friends smoked, 67 per cent predicted that they definitely would not be smoking in three years. But when the number of friends who smoked increased, the percentage predicting they would not be smoking decreased, and the percentage predicting they would be increased. However, an unusual trend became obvious among the non-smokers and experimental smokers. When the number of their friends who smoked was greater

than three-quarters, the proportion predicting they probably would be smoking in three years decreased dramatically from 31.3 per cent to 5.0 per cent for non-smokers and from 54.2 per cent to 30.0 per cent for experimental smokers. As stated earlier, having a lot of personal contact with smokers probably increased their awareness of the problems related to smoking and of the difficulty in quitting once it was habitual. When a person admits to himself that most of his friends are experiencing problems related to smoking, it probably has a great deal of impact and a deterrent effect upon him.

Lastly, the academic and achievement orientation of the smokers seemed to differ from the non-smokers. Half of the smokers planned on taking further training past high school (university, vocational or technical training) while two-thirds of the non-smokers planned on further education. These findings were consistent with the results of previous research in the area of smoking and academic goals (Horn et al., 1959; Bajda, 1964; Briney, 1967). Since the actual achievement levels of smokers and non-smokers were not measured, it cannot be assumed that smokers actually do achieve less than non-smokers academically. Therefore, no conclusions can be made concerning whether or not smoking is a form of compensatory behavior for underachievers.

## II. HYPOTHESES

The data supported the null hypotheses 1 and 2 that there were no significant differences in the proportion of smokers in the control

and two treatment groups on the pre-test and post-test. The results of Hypothesis 1 were as expected and allowed the assumption to be made that the three groups were from populations having the same proportion of smokers. The results of Hypothesis 2 were interesting and not unexpected, although it could have been argued that the intensive treatment program in group C would have affected the proportion of smokers in that group. The single presentation that group B received was not expected to have had much of an effect. Neither treatment program had a significant effect upon the difference in proportion of smokers among the three groups.

It was stated in Hypothesis 3 that there would be no significant differences between the proportion of smokers within each group on the pre and post-test. The null hypothesis was supported for the control group. However, the results obtained for the two treatment groups were puzzling. There were significant increases in the proportion of smokers within the two treatment groups during the five month period between the pre and post-test. Consequently, the smoking and health program seemed to be having the opposite effect of what was intended. The program may have increased the curiosity of some of the young people about smoking tobacco. Some may have had a strong desire to experience smoking for themselves. There may also have been an element of rebelliousness in the behavior of some of the new smoking recruits. It must be considered that the program was only in effect for five months, and there was no way of determining whether the increases were permanent or not. The new smoking population could be unstable

with many quitting in the future. Perhaps the treatment program has an initial effect of increasing use of tobacco. It is possible, however, that within time the shift towards more negative attitudes and the increase in factual information about smoking and health, may have a significant deterrent effect upon smoking behavior. The importance and necessity for a follow-up study is strongly indicated.

It would appear that there was a causative relationship between the treatment programs and the increase in proportion of smokers. However, there were several possible confounding variables to consider. The greatest increase in smokers in group B or C could have occurred in one school. If this were the case, then an uncontrolled variable could have affected the results. Socioeconomic status was an uncontrolled variable, since a cross-section of the grade seven student population was desired. It is possible that schools of different socioeconomic status responded very differently to the treatment program in the experimental groups, significantly affecting the proportion smoking in one or two schools. Lastly, it must be remembered that buying cigarettes is illegal for twelve and thirteen year olds and smoking is usually prohibited by the school and by some parents. Because anonymity could not be guaranteed, some students were probably apprehensive about responding truthfully on the pre-test. However, it is possible that exposure to the treatment programs may have had the effect of reducing the smoker's fears of responding truthfully; consequently, the number of students who reported they smoked may have increased on the post-tests of groups B and C. The

control group received no reassuring intervention between the pre and post-test.

Hypothesis 4 which stated that there were no significant differences among the mean negative attitude towards smoking scores of the three groups on the pre-test was rejected in part, for there was a significant difference between the means of groups A and B, and groups B and C. Because of sampling bias, group B was not comparable to groups A and C; therefore, it was excluded from analysis on the post-test. It was assumed that groups A and C were from populations having the same mean attitude towards smoking. Hypothesis 5 which stated that there were no significant differences among the mean attitude scores of the groups on the post-test was rejected with respect to groups A and C. Group C, having received the intensive smoking and health program had a significantly different negative attitude towards smoking mean than the control group A. Examining the means, it could be seen that group C had a more negative attitude towards smoking.

It was interesting to note that, although the treatment program applied in group C was effective in promoting more negative attitudes towards smoking, it was not effective to date in decreasing the proportion of regular smokers. These results were consistent with the studies which have found that health reasons were important but not sufficient to cause behavioral change (Morison, 1960-68; Lawton and Goldman, 1961; Baer, 1966). As Lawton and Goldman (1961) pointed out, not even involvement in lung-cancer smoking research was

sufficient to modify smoking behavior. Fodor and Glass (1968) found that smokers were aware of the dangers of smoking, but that they felt moderate smoking was without risk for the healthy individual. Smokers often reduce the cognitive dissonance created by smoking by minimizing the personal relevancy of the danger and by underestimating their own consumption of tobacco (Pervin and Yakto, 1965; Davis, 1968). Unfortunately, in this study there was no way of determining whether the smokers were actually underestimating the amount they smoked.

Hypothesis 6 stated that there were no significant differences among the mean attitude scores of smokers in groups A, B and C on the pre-test. Group B had a significantly different mean than group A, so the null hypothesis was rejected for groups A and B. No significant differences were found between the means of groups A and C, and B and C, and the null hypothesis was not rejected for these groups. Groups A and B were not compared on the post-test. Hypothesis 7 stated that there were no significant differences among the mean scores of smokers in each group on the post-test. The null hypothesis was rejected for groups A and C, but not for B and C. It could be seen that group C smokers became more negative towards smoking as a result of the treatment program applied. The smokers in group C were not more negative than the smokers in group B; therefore, the treatment in group B must have had some effect upon the attitudes of the smokers.

Lastly, it was important to note that a significantly greater

proportion of non-smokers than smokers in all the groups, on both the pre and post-test, agreed to three statements relating smoking with lung cancer, heart disease, chronic bronchitis and emphysema. In group C, in particular, it would seem that the smokers either did not pay attention to, or denied the information presented, otherwise the proportion agreeing to the statements would have been more comparable to the proportion of non-smokers agreeing. As stated in Chapter II, the magnitude of cognitive dissonance depends upon the importance of the dissonant elements, and upon the proportion of relevant elements that are dissonant. Since it was difficult for the student smoker to avoid the lecture-presentations, the smoker in group C was presented with many excellent reasons for not smoking, once a month for five months. With more reasons known for quitting than for smoking, the smoker, still continuing to smoke, found himself in a state of dissonance or psychological tension. Most smokers had not quit smoking at the time of the post-test; i.e., had not changed the behavioral cognitive element. Consequently, the only other two means of reducing dissonance were to change the environmental cognitive elements, i.e., ignore, deny or distort the information about smoking and health, or to add new cognitive elements, i.e., seek out information which would lessen the impact of the smoking and health relationship.

## III. SUMMARY OF MAJOR RESULTS

The null hypotheses were tested using two different statistical procedures and the following results were obtained:

a. There were no significant differences on the post-test among the proportion of smokers in the control group A, in the experimental group B, which received a single treatment program, or within the experimental group C, which received an intensive treatment program.

b. There was a significant difference between the proportion of smokers in treatment group B on the pre and post-test, and between the proportion of smokers in group C on the pre and post-test. In fact, the proportion of smokers increased significantly in groups B and C, as a result of the smoking and health program.

c. There was a significant difference on the post-test between the mean negative attitude towards smoking scores of the control group and the experimental group which received an intensive treatment program.

d. There was a significant difference on the post-test between the mean negative attitude towards smoking scores of the smokers in the control group A, and the smokers in the experimental group C which received an intensive treatment program.

## IV. CONCLUSIONS AND IMPLICATIONS FOR FURTHER RESEARCH

The incidence of smoking tobacco is increasing among adolescents, and it has been said that those who begin at an early age are more likely to suffer from the detrimental effects of smoking cigarettes and to have a more difficult time quitting (Horn, 1963). Research has been done and is still required in developing effective

programs in deterring young people from smoking. The present study, descriptive and exploratory in nature, had a two-fold purpose. First, it was to provide information on the smoking behavior of a representative cross-section of grade seven students in an urban setting. Second, it was to evaluate the effectiveness of the "hard medical facts" approach, under two treatment intensities, in deterring young people from smoking, increasing their knowledge about the health hazards of smoking, and in promoting a more negative attitude towards smoking.

The results of the descriptive survey study indicated that approximately 10 per cent of the students involved were already regular smokers by the middle of their seventh year in school. The incidence of smoking among girls appeared to be increasing, and a greater proportion of females than males were regular smokers. That parents, older siblings and peers have an influence on adolescent smoking was supported by the data.

Neither the intensive program nor the single presentation program had significant effect upon smoking behavior when the proportions of smokers among the three groups were considered. However, when within group change from the pre to post-test was examined, significant increases in the proportion of smokers were found in the two treatment groups, but not in the control group. Perhaps the program stimulated the curiosity or rebelliousness of some, causing at least a temporary increase in the use of tobacco. The duration of the study was only five months, and the long term effects cannot be

predicted.

Although the results with respect to the effectiveness of the treatment program in changing behavior were inconclusive, the results concerning attitudinal change were encouraging. The attitudes of those in the intensive treatment program became more negative towards smoking. Consequently, it is important that these students be followed through the next few years, in order to determine whether their increased knowledge of the hazards of smoking, and their more negative attitudes will eventually influence their smoking behavior. The effectiveness of the single-presentation in altering attitudes could not be determined. Group B was excluded from the analysis because of a sampling bias.

Further research is indicated in several areas. First, interactional effects of attitudinal change resulting from a smoking and health treatment program could be included in the data analysis. Random sampling, although less convenient than using intact groups, might be used in a future study to prevent sampling bias. Studies in which socioeconomic factors are controlled would provide additional data with respect to possible varied responses of different socioeconomic groups to treatment programs. The response to an authoritative treatment program could also be examined with regard to socioeconomic variables. It may be that an authoritative approach is less effective with certain socioeconomic groups. Further, the values of the different groups may be quite different with respect to concern for personal health. This area should be investigated too, for smoking

programs must be developed which are relevant to the values of those involved. If a group of individuals do not value health, then a program must be developed which either increases the concern for personal health, or takes a different approach altogether, emphasizing more relevant reasons for not smoking

Although this study has concerned itself primarily with the sociopsychological reasons for smoking, the fact that nicotine in cigarettes is addictive should not be over looked. Nicotine, an alkaloid poison, can act as a stimulant, depressant or tranquilizer and dependency can develop very quickly. Only 2 per cent of cigarette smokers are intermittent or occasional users of tobacco.

> The typical pattern of nicotine use, moreover, is not only daily but hourly. Nearly four male smokers out of five and more than three female smokers out of five consume fifteen or more cigarettes a day--roughly one or more per waking hour (Brecher, 1972, p. 223).

The results of animal studies and observations of the patterns of cigarette consumption of addicted smokers suggest that a nicotine dose is required every twenty to thirty minutes to maintain an adequate level of the drug in the brain.

Dr. Hamilton Russell of the Addiction Research Unit (ARU) of the Institute of Psychiatry, London, reported that about 70 per cent of the adolescents who smoked more than one cigarette continued to smoke for the next forty years of their lives. He explained that for most young people, their first cigarette is unpleasant. Some never smoke again. However, if the person smokes again, despite the unpleasant side effects,

> tolerance soon develops to the unpleasant side-effects and skill is quickly acquired to limit the intake of smoke to a comfortable level, thus lowering the threshold for further attempts. Herein lies a possible cause of the virtual inevitability of escalation after only a few cigarettes. With curiosity satisfied by the first cigarette, the act is likely to be repeated only if the physical discomfort is outweighed by the psychological or social rewards. If these motives are sufficient to cause smoking to be repeated in the face of unpleasant side-effects, there is little chance that smoking will not continue as these side-effects rapidly disappear (Russell, 1971, pp. 8-9).

Withdrawal symptoms are both physical and psychological, and include

> nervousness, drowsiness and anxiety in a majority of smokers, while reports of lightheadedness, headache, energy loss, fatigue, constipation or diarrhea, insomnia and dizziness are also common. Other frequent consequences of quitting smoking include compulsive overeating, impaired concentration, social discomfort and depression ("Tobacco and Health," 1974, p. 2).

For the reader who is interested in obtaining further information regarding cigarette smoking as an addiction, the following are references to which one can refer: Johnston, 1942; Finnegan et al., 1945; Knapp et al., 1963; Ejrup, 1964; 1964; Ross, 1964; Russell, 1971; and Brecher, 1972.

With reference to program development, it is important that smoking education begin in the elementary school--preferably in grade one. Effective use can be made of teacher-led programs with the assistance of resource persons, such as doctors, dentists and nurses. At this age level, children have a great deal of respect for such people. At the junior high level, preference should be given to student initiated programs. At the high school level, in-depth courses on the psychology, physiological effects of smoking

could be examined. Students could research the effects of smoking in science classes. It should be remembered that with smokers, less fear arousing communications are more effective in changing attitudes and behavior. Low-key communications with open-ended discussions seem most effective.

Lastly, it should be added that any school program in smoking and health will have difficulty in influencing the child, if strong counter-influences confront him at home. The strong influence of parental and sibling smoking behavior upon children has been demonstrated. Consequently, unless programs are developed which influence the significant others who are in daily contact with the child, school programs will be much less effective than they could be. It may be advantageous to develop programs, which in some way involve the parents. For example, schools could co-sponsor how-to-quit-smoking groups with local health organizations. Perhaps students could also be encouraged to attend at the junior and senior high levels. Further, the school administrators and teachers should also be encouraged to participate. Especially at the older grade levels, those leading smoking programs must be persons who are well-liked and respected by the adolescents.

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# APPENDIX A

## BRIEF OUTLINES OF SMOKING AND HEALTH PRESENTATIONS BY DR. MELTZER FOR GROUPS B AND C

GROUP B

SINGLE PRESENTATION BY DR. MELTZER

I. Introduction

A. Purpose of Program

Out of concern as a medical person, Dr. Meltzer stated that he wanted to present information about smoking and health. The medical profession is losing ground in controlling the rate of loss of life related to diseases caused by smoking. Dr. Meltzer stressed that he will only present information. There are no shoulds about smoking. It is a personal decision.

II. Composition of Cigarette Smoke and the Effects of It

A. 3 major concerns:

1) tar--cancer producing; affects cell linings;

2) nicotine--affects blood vessels; causes hardening of arteries and blood clotting;

3) carbon monoxide--interferes with use of oxygen.

III. Brief History of Cigarette Smoking and Consumption Trends and Economic Costs Related to Smoking

IV. 3 Major Smoking-related Diseases (Effects of Diseases, Facts and Statistics)

A. Cancer of lung

B. Chronic bronchitis and pulmonary emphysema

C. Heart disease

V. Conclusion of Formal Presentation

Dr. Meltzer concluded by saying that deciding not to smoke is a personal decision which may preserve your health. With this information, the children were encouraged to influence their parents. Lastly, he suggested that if one does smoke, only smoke half your cigarette, smoke fewer, and don't inhale.

VI. Film: "Breath of Air"

This film stressed that "being in poor health can take the joy out of living." Facts and statistics were discussed and patients with various smoking-related diseases were shown.

VII. Question and Answer Period

VIII. "10 Little Smokers," a small pamphlet was distributed.

GROUP C

PRESENTATIONS IN BRIEF OUTLINE

I. First Presentation

A. Introduction and overview of program

B. Film: "A Breath of Air"

C. Discussion

II. Second Presentation

A. Man-made diseases: lung cancer, pulmonary emphysema, chronic bronchitis and coronary heart disease

B. History of tobacco smoking

C. Composition of tobacco smoke and its effects

D. Question and answer period

E. Five minute cartoon film: reinforces that your heart and lungs are your "best friends"

III. Third Presentation

A. Major focus: cancer of the lung

Cancer of the lung is rapidly increasing and parallels the increasing use of cigarettes. The difficulties in treating this disease were discussed. Prevention is the only solution.

B. Discussed smoking trends among the young, and the greater risk young people face if they begin to smoke at an early age.

C. Film: "Smoker's Lung." A factual demonstration of what happens to the bronchial tree and lungs when exposed to cigarette smoke. Slides compared diseased and healthy tissue..

D. Question and answer period

E. Reader's Digest reprint distributed: "Do You Know What Happens When You Smoke?"

IV. Fourth Presentation

A. Major focus: Chronic Bronchitis and Emphysema

The process of normal breathing and respiration was discussed. The way in which tar seriously damages cilia, causing bronchitis and emphysema was explained. That there is no cure for emphysema was stressed. Prevention is the only solution. Statistics were presented.

B. Film: "Life and Breath"

In this film a personal case of emphysema was shown, as well as some of the research that is being done. There was a re-enactment of the progressive stages of the man's disease. The man was fatally ill.

C. Question and answer period

V. Fifth Presentation

A. Major focus: coronary heart disease

B. Film: "Smoking and Heart Disease"

In this film it was demonstrated how damage occurs to the lungs, heart and blood vessels. It was stressed that if one quits smoking, a recovery process occurs. Further, in ex-smokers, there is a decreased chance of heart attacks, and the death rate from all causes approaches normalcy.

C. Discussion Period.

Dr. Meltzer concluded by impressing upon the students what he has seen as a physician and surgeon. The treatment for many of these man-made diseases is useless. He encouraged them to weigh all the factors in making a decision to smoke or not to smoke.

# APPENDIX B

## STUDENTS' THOUGHTS ABOUT CHANGING THEIR SMOKING HABITS

## (PRE-TEST)

## STUDENTS' THOUGHTS ABOUT CHANGING THEIR SMOKING HABITS

## (PRE-TEST)

| Smoking Status and Thoughts About Changing | | Number of Students | Percentage of Students |
|---|---|---|---|
| Non-Smokers | Have Considered | 92 | 5.4 |
| Non-Smokers | Not Considered | 930 | 54.4 |
| Ex-Smokers | Have Considered | 89 | 5.2 |
| Ex-Smokers | Not Considered | 832 | 19.4 |
| Smokers | Have Considered | 188 | 11.0 |
| Smokers | Not Considered | 55 | 3.2 |
| No Response | | 24 | 1.4 |
| Total | | 1,710 | 100.0 |

# APPENDIX C

## PRE-TEST STUDENT RESPONSES TO ATTITUDE STATEMENTS IN PERCENTAGES

PRE-TEST STUDENT RESPONSES TO ATTITUDE

STATEMENTS IN PERCENTAGES

| | Agree | Disagree | No Response |
|---|---|---|---|
| Cigar and pipe smoking are harmful to health. | 88.3 | 11.2 | 0.5 |
| No one really knows if there is a connection between lung cancer and smoking. | 17.9 | 81.8 | 0.3 |
| I do not like to be near a person who is smoking cigarettes. | 55.4 | 44.0 | 0.6 |
| The laws about smoking by young people should be strongly enforted. | 48.0 | 51.3 | 0.7 |
| Smoking cigarettes makes you feel more important and grown up. | 28.8 | 70.6 | 0.6 |
| If you smoke cigarettes it is hard to stop. | 73.6 | 24.0 | 2.4 |
| Smoking is pleasurable. | 27.4 | 67.9 | 4.7 |
| When I have children I hope they never smoke. | 88.4 | 10.0 | 1.6 |
| Of all causes of death, cigarette smoking is the most easily prevented. | 44.6 | 54.2 | 1.2 |
| Cigarette smoking helps people to feel less nervous. | 54.5 | 44.5 | 1.0 |
| Cigarette smoking is the leading cause of lung cancer. | 85.4 | 14.0 | 0.6 |
| Cigarette smoking shortens a person's life. | 87.3 | 11.8 | 0.9 |
| If a person does not inhale smoke, cigarettes are harmless. | 38.1 | 61.5 | 0.4 |

| | Agree | Disagree | No Response |
|---|---|---|---|
| The chances of getting lung cancer from smoking are so small, that it is not worth worrying about it. | 8.0 | 91.8 | 0.2 |
| Quitting smoking helps a person to live longer. | 80.3 | 18.9 | 0.8 |
| There is nothing wrong with smoking as long as a person smokes moderately. | 29.4 | 70.0 | 0.6 |
| Cigarette smoking is bad for one's health. | 90.9 | 8.4 | 0.7 |
| Cigarette smokers are more likely to die from heart disease than people who don't smoke. | 71.5 | 28.1 | 0.4 |
| The whole problem of cigarette smoking and health is a very small one. | 11.6 | 87.5 | 0.9 |
| Smoking is a dirty habit. | 68.9 | 30.5 | 0.6 |
| In smokers, the chances of getting chronic bronchitis or emphysema are much greater than in non-smokers. | 86.5 | 12.7 | 0.8 |
| If a person has already been smoking for many years, stopping smoking won't help him. | 22.3 | 77.2 | 0.5 |
| The bad smell on a smoker's breath and clothing bothers me. | 70.8 | 28.6 | 0.6 |
| Cigarette smoking is not harmful to young people. | 9.9 | 89.6 | 0.5 |
| Cigarette smoking doesn't affect the average person's breathing. | 17.9 | 81.6 | 0.5 |

| | Agree | Disagree | No Response |
|---|---|---|---|
| Filters on cigarettes reduce the risk of getting cancer. | 44.8 | 54.6 | 0.6 |
| People should consider the discomfort of others who might be bothered by cigarette smoke. | 87.8 | 11.4 | 0.8 |
| People have enough problems without adding to them by trying to give up smoking. | 24.7 | 74.5 | 0.8 |
| Lots of people I know smoke and it doesn't seem to hurt them. | 48.2 | 50.9 | 0.9 |
| Smoking costs more than the pleasure is worth. | 85.4 | 13.6 | 1.0 |
| There is nothing wrong with smoking cigarettes. | 15.4 | 84.0 | 0.6 |
| Smoking makes a person feel good. | 35.8 | 63.2 | 1.0 |

# APPENDIX D

## COPY OF QUESTIONNAIRE USED IN STUDY

UNIVERSITY OF ALBERTA

I am asking you to help me in an important research project. This project, which will continue during 1974-1976, is being done to study attitudes about smoking and the actual smoking behavior of students in junior high school. The population in Edmonton is a mobile one, that is, people are frequently moving. Since we wish to study changes that may occur in your particular group over the next three years, we must keep track of those taking part. Therefore, we are asking you to use your student ID. number on this form. However, your answers will be kept strictly confidential and will only be used for research purposes.

Instructions

This paper is for students in grades 7, 8 and 9. This is not a test and there are no right or wrong answers. Don't worry about the numbers in the right-hand margin of the page. They are for the computer.

Read each question carefully, and then circle the number at the end of the answer that you choose. Circle only ONE answer for each question. Please do not leave any questions unanswered.

Example

How much is 15 + 15 - 5?

30 _____ 1
28 _____ 2
25 _____ (3)
26 _____ 4

Since 15 + 15 - 5 is 25, 3 is circled.

Reserved for Coding

My student ID number is _____ 1-13

I am a: boy _____ 1
girl _____ 2 14

My age today is:
10 years _____ 1
11 years _____ 2
12 years _____ 3
13 years _____ 4 15
14 years _____ 5
15 years _____ 6
16 years _____ 7
17 years _____ 8
18 years _____ 9

What school are you attending this year? _____ 16,17

_____

What grade in school are you now? _____ 7 8 9 18

How far do you plan on going in school?

I do NOT plan on finishing high school _____ 1

I plan on finishing high school _____ 2

After high school I plan to go to business school, vocational school, teachers' college, nursing _____ 3 19

After high school I plan to go to University _____ 4

I don't know _____ 5

My father smokes cigarettes _____ 1

does not smoke _____ 2 20

has quit smoking _____ 3

I don't have a father _____ 0

My mother smokes cigarettes _____ 1

does not smoke _____ 2 21

has quit smoking _____ 3

I don't have a mother _____ 0

I have at least one older brother

who smokes and at least one who doesn't smoke _____ 1

who smokes cigarettes _____ 2

who does not smoke _____ 3 22

who has quit smoking _____ 4

or I do not have an older brother _____ 5

I have at least one older sister

who smokes and at least one who doesn't smoke _____ 1

who smokes cigarettes _____ 2

who does not smoke _____ 3 23

who has quit smoking _____ 4

or I do not have an older sister _____ 5

My best friend of the same sex as myself smokes cigarettes.

Yes _____ 1 24

No _____ 2

I have a steady date who smokes cigarettes.

Yes _____ 1

No _____ 2 25

I don't have a steady date _____ 3

How does your Mother feel about young people smoking?

She says it's alright _____ 1

She disapproves _____ 2

She forbids it _____ 3 26

She doesn't care one way or the other _____ 4

I don't have a mother _____ 5

Do you think your Mother knows whether you smoke?

Yes _____ 1

No _____ 2

I don't smoke _____ 3 27

I don't have a mother _____ 4

If Yes, does she care?

Yes _____ 1

No _____ 2 28

How does your Father feel about young people smoking?

He says it's alright _____ 1

He disapproves _____ 2

He forbids it _____ 3 29

He doesn't care one way or the other _____ 4

I don't have a father _____ 5

Do you think your Father knows whether you smoke?

Yes _____ 1

No _____ 2

I don't smoke _____ 3 30

I don't have a father _____ 4

If Yes, does he care?

Yes _____ 1

No _____ 2 31

Have you ever smoked any cigarettes?

I have never smoked a cigarette _____ 1

I have smoked just one cigarette in my life _____ 2

I have smoked more than 1 but less than 10 cigarettes in my life _____ 3

I have smoked more than 10 but less than 25 cigarettes in my life _____ 4 32

I have smoked more than 25 but less than 100 cigarettes in my life _____ 5

I have smoked more than 100 cigarettes in my life (more than 5 packs) _____ 6

How much do you smoke?

I don't smoke _____ 1

I don't smoke but used to smoke an average of:

Less than 1 cigarette a month _____ 2

Less than 1 cigarette a week _____ 3

More than 1 cigarette a week, but not every day _____ 4

One cigarette a day _____ 5 33,34

Two to five cigarettes a day _____ 6

Six to ten cigarettes a day _____ 7

Half a pack to a whole pack a day _____ 8

Over 1 pack a day _____ 9

I now smoke on an average of:

Less than 1 cigarette a month _____ 10

Less than 1 cigarette a week _____ 11

More than 1 cigarette a week, but less than 1 every day _____ 12

One cigarette a day _____ 13

Two to five cigarettes a day _____ 14

Six to ten cigarettes a day _____ 15

Half a pack to a whole pack a day _____ 16

Over 1 pack a day _____ 17

Three years from now how many of your friends do you think will be cigarette smokers?

None of them _____ 1

Less than half of them _____ 2

About half of them _____ 3

More than half of them _____ 4 35

All of them _____ 5

Three years from now I:

Definitely will not be smoking _____ 1

Probably will not be smoking _____ 2

Probably will be smoking _____ 3 36

Definitely will be smoking _____ 4

In your special group of friends, how many of them smoke cigarettes?

None _____ 1

A quarter or less of my special group of friends _ 2

Between 1/4 and 1/2 of all my special group of friends _____ 3 37

Between 1/2 and 3/4 of my special group of friends _____ 4

More than 3/4 of my special group of friends _____ 5

How do you feel about the following statements? For each statement on the left, circle the answer on the right which best describes how you feel. Circle 1 if you agree, and circle 8 if you disagree.

| Example | Agree | Disagree | |
|---|---|---|---|
| I enjoy reading books | 1 | 8 | |
| If you disagree to this statement, you would circle 8 as in the example. | | | |
| Cigar and pipe smoking are harmful to health. | 1 | 8 | 38 |
| No one really knows if there is a connection between lung cancer and smoking. | 1 | 8 | 39 |

| | Agree | Disagree | |
|---|---|---|---|
| I do not like to be near a person who is smoking cigarettes. | 1 | 8 | 40 |
| The laws about smoking by young people should be strongly enforced. | 1 | 8 | 41 |
| Smoking cigarettes makes you feel more important and grown up. | 1 | 8 | 42 |
| If you smoke cigarettes it is hard to stop. | 1 | 8 | 43 |
| Smoking is pleasurable. | 1 | 8 | 44 |
| When I have children I hope they never smoke. | 1 | 8 | 45 |
| Of all causes of death, cigarette smoking is the most easily prevented. | 1 | 8 | 46 |
| Cigarette smoking helps people to feel less nervous. | 1 | 8 | 47 |
| Cigarette smoking is the leading cause of lung cancer. | 1 | 8 | 48 |
| Cigarette smoking shortens a person's life. | 1 | 8 | 49 |
| If a person does not inhale smoke, cigarettes are harmless. | 1 | 8 | 50 |
| The chances of getting lung cancer from smoking are so small, that it is not worth worrying about it. | 1 | 8 | 51 |
| Quitting smoking helps a person to live longer. | 1 | 8 | 52 |
| There is nothing wrong with smoking as long as a person smokes moderately. | 1 | 8 | 53 |
| Cigarette smoking is bad for one's health. | 1 | 8 | 54 |
| Cigarette smokers are more likely to die from heart disease than people who don't smoke. | 1 | 8 | 55 |
| The whole problem of cigarette smoking and health is a very small one. | 1 | 8 | 56 |

| | Agree | Disagree | |
|---|---|---|---|
| Smoking is a dirty habit. | 1 | 8 | 57 |
| In smokers, the chances of getting chronic bronchitis or emphysema are much greater than in non-smokers. | 1 | 8 | 58 |
| If a person has already been smoking for many years, stopping smoking won't help him. | 1 | 8 | 59 |
| The bad smell on a smoker's breath and clothing bothers me. | 1 | 8 | 60 |
| Cigarette smoking is not harmful to young people. | 1 | 8 | 61 |
| Cigarette smoking doesn't affect the average person's breathing. | 1 | 8 | 62 |
| Filters on cigarettes reduce the risk of getting cancer. | 1 | 8 | 63 |
| People should consider the discomfort of others who might be bothered by cigarette smoke. | 1 | 8 | 64 |
| People have enough problems without adding to them by trying to give up smoking. | 1 | 8 | 65 |
| Lots of people I know smoke and it doesn't seem to hurt them. | 1 | 8 | 66 |
| Smoking costs more than the pleasure is worth. | 1 | 8 | 67 |
| There is nothing wrong with smoking cigarettes. | 1 | 8 | 68 |
| Smoking makes a person feel good. | 1 | 8 | 69 |

Have you ever thought about changing your smoking habits?

I don't smoke but have considered taking up smoking _____ 1

I don't smoke and have not considered taking up smoking _____ 2

I used to smoke and have considered taking up smoking again _____ 4

I used to smoke but have not considered taking up smoking again _____ 4

I now smoke and have thought about quitting cigarette smoking _____ 5 70

I now smoke and have not thought about quitting ___ 6

Pre or Post 1 or 2 71

Group Number 1, 2 or 3 72

You have now completed the questionnaire. Thank you for your time and cooperation.